

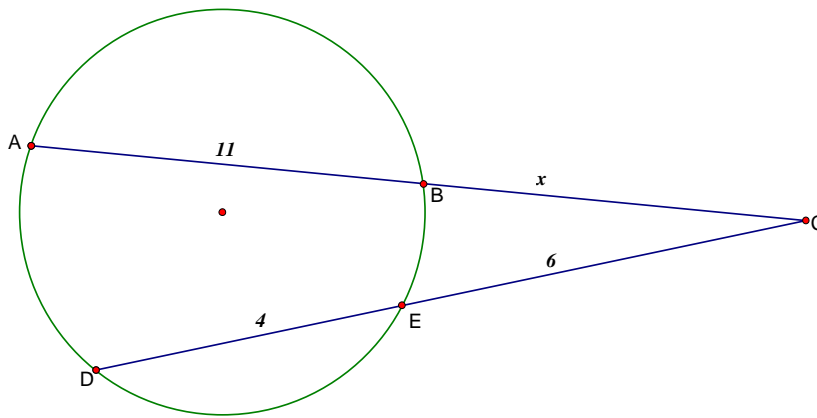
Do the following problems as indicated.

1. Tell whether given statement is ALWAYS, or SOMETIMES or NEVER true.
 - a. The center of a circle is a point on the circle.
 - b. Tangent segments drawn to a circle from an external point are congruent.
 - c. If a quadrilateral is inscribed in a circle, then its consecutive angles are supplementary.
 - d. If the diagonals of a quadrilateral inscribed in a circle are diameters of the circle, then it is a rectangle.
 - e. A diameter that is perpendicular to a chord bisects the chord.
 - f. Two concentric circles have at least one point in common.
 - g. If two circles are tangent, then their point of tangency and their centers are collinear.
 - h. Parallel chords of a circle are congruent.
 - i. If \widehat{AB} and \widehat{CD} are two arcs in a circle with $m\widehat{AB} > m\widehat{CD}$, then the chord \overline{CD} is nearer the center of the circle.
 - j. If a triangle is inscribed in a circle and one of its sides is a diameter, then the triangle is isosceles.

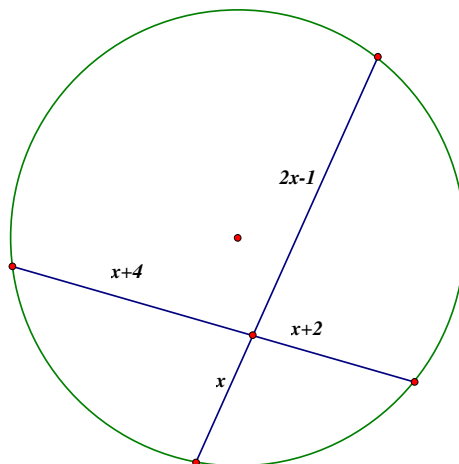
2. Identify the following.
 - a. Locus of points equidistant from points A and B: _____.
 - b. Locus of points equidistant from two concentric circles with radii 2 cm and 6 cm: _____.
 - c. Point of concurrency of the three altitudes of a triangle: _____.
 - d. Locus of points equidistant from the three noncollinear points P, T and S: _____.
 - e. The point of concurrency of the three medians of a triangle: _____.
 - f. Segment drawn from the center of a regular polygon to a vertex: _____.
 - g. Segment drawn from the center of a regular polygon perpendicular to a side: _____.
 - h. Angle formed by consecutive radii of a regular polygon: _____.

3. Find x:

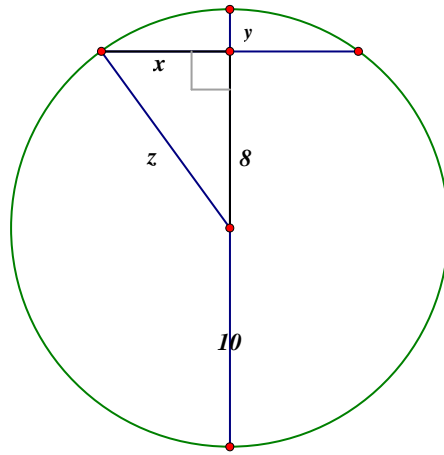
a.



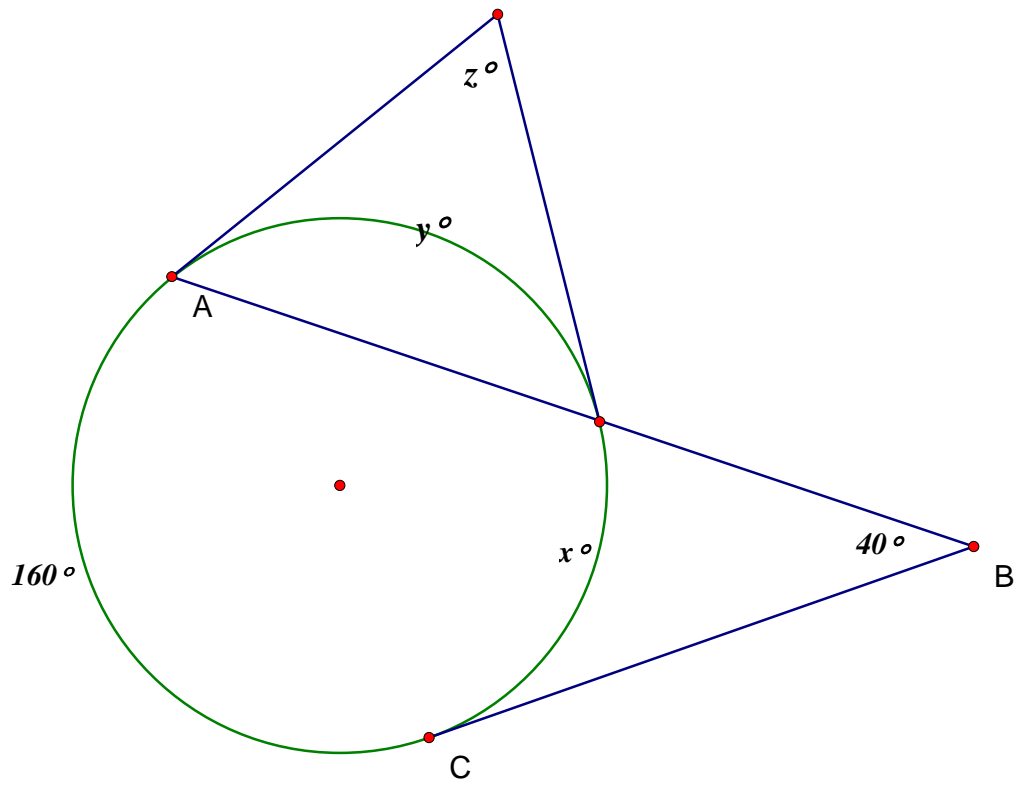
b.



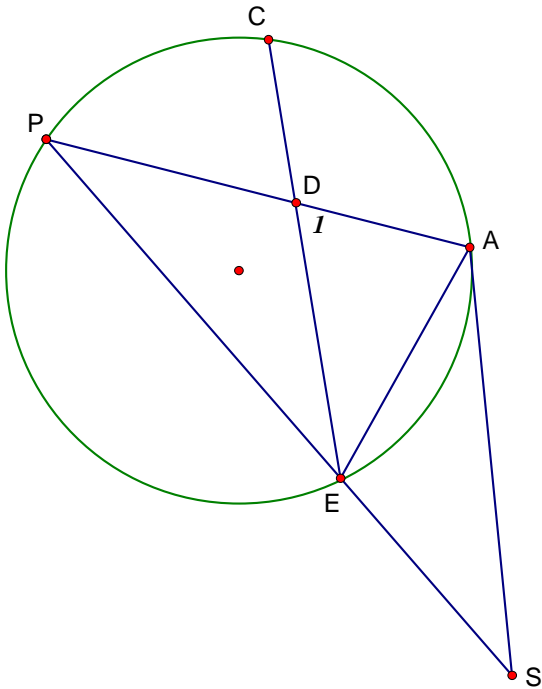
4. Find x , y and z .
a.



- b.



5.



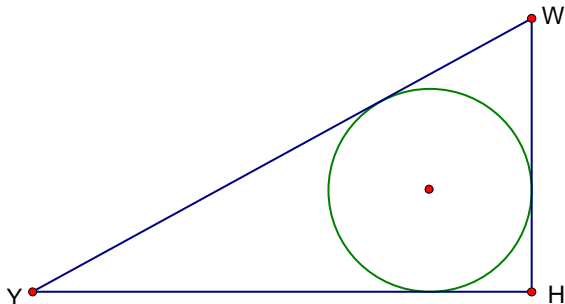
a. If $m\angle 1 = 50^\circ$ and $m\angle APE = 20^\circ$,
find $m\widehat{PC}$ and $m\angle PEC$.

b. If $m\angle 1 = 40^\circ$ and $m\widehat{AC} = 120^\circ$,
find $m\angle PAE$ and $m\widehat{PE}$.

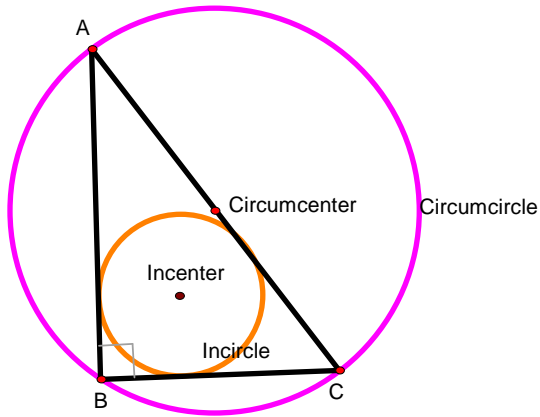
c. If $PD = 9$, $DA = 4$, $CE = 12$,
find CD .

d. If $SE = 3$, $PE = 12$,
find SA .

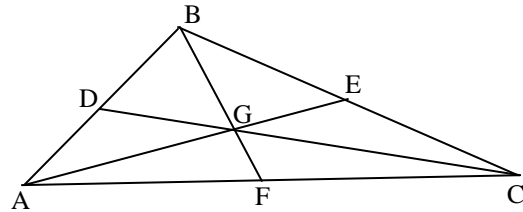
6. Find the perimeter of the right $\triangle WHY$ if the radius of the inscribed circle is 4 cm and $WY = 20$ cm.



7. For a right triangle whose legs are of length 10 cm and 24 cm:
- Find the length of the radius of the circumscribed circle.
 - Find the length of the radius of the inscribed circle.



8. Given: $\triangle ABC$ with medians \overline{AE} , \overline{DC} , \overline{BF}
- Find: a. BG if $BF = 18$
 b. GE if $AG = 4$
 c. DG if $CG = 4\sqrt{3}$



9. If $\triangle ABC$ is inscribed in a circle, and $m\angle A > m\angle B$, prove that $m\widehat{BC} > m\widehat{AC}$.
10. Provide a drawing, write the given and prove statements, and write a two-column proof for the following:
- The common internal tangent segments of any two circles are congruent.
 - If a trapezoid is inscribed in a circle, then it is an isosceles trapezoid.
11. Construct:
- The inscribed circle of a scalene triangle.
 - The centroid of an obtuse triangle.
 - The tangent to a circle from an exterior point.
 - The circumscribed circle of a right triangle
 - The inscribed circle of a rhombus or a kite
 - The circumscribed circle of an isosceles trapezoid or a rectangle

12. Given: \overline{GM} is a diameter of $\odot O$,

$$\overline{MY} \parallel \overline{EO}$$

Prove: $m\widehat{GE} = m\widehat{YE}$

